Spins and Parities of the Levels of C^{13}

S/048/60/024/007/005/011
B013/B060

There are 6 figures and 6 references: 2 Soviet and 4 US.

ASSOCIATION: Institut fiziki Akademii nauk USSR
(Institute of Physics of the Academy of Sciences UkrSSR)
Institut "Rudžer Bošković" Zagreb, Yugoslaviya
(Institute "Rudžer Bošković", Zagreb, Yugoslavia)

Card 3/3

S/048/60/024/007/023/032/XX
B019/B056

24.6600

AUTHORS: Zaika, N. I. and Nemets, O. F.

TITLE: Spins and Parities of the Levels of the Ti^{47-50} and Sr^{89}

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960
Vol. 24, No. 7, pp. 865-868

TEXT: This paper was read at the 10th All-Union Conference on Nuclear Spectroscopy, which took place from January 19 to January 27, 1960 at Moscow. The authors endeavored to measure the angular distribution of the protons from Ti^{46}, Ti^{47}, Ti^{48}, and Ti^{49} and Sr^{88}. The deuterons were accelerated to 13.6 Mev in the cyclotron of the institute mentioned under Association. From the angular distributions of the protons from the reaction $Ti^{46}(d,p)Ti^{47}$ shown in Fig. 1 it follows that the quantum characteristic of the ground state of Ti^{47} is $5/2^-$ or $7/2^-$. The cross section of this reaction is greater than that of the reaction $Ti^{48}(d,p)Ti^{49}_{ground}$. For the reaction $Ti^{47}(d,p)Ti^{48}_{ground}$ the quantum characteristic of the

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85589

Spins and Parities of the Levels of the Ti^{47-50} and Sr^{89}

S/048/60/024/007/023/032/XX
B019/B056

ground state of 0^+ is obtained. For the Ti^{47} and Ti^{48} ground states angular momenta of $l_n = 3$ are given. For the 1.33- and 2.31-Mev levels possible values of 1^+, 2^+, 3^+, and 4^+ are obtained. For the ground state of Ti^{49} and the 1.35 Mev, 1.7 Mev, and 2.4 Mev excited states 3 1, 1 and 1+3 respectively are obtained for l_n. The possible values of the quantum characteristics: $5/2^-$ or $7/2^-$; $1/2^-$ or $3/2^-$; $1/2^-$ or $3/2^-$ and $1/2^-$ or $3/2^-$ respectively; $5/2^-$ or $7/2^-$. The quantum characteristic of the ground state of Ti^{50} is given as 0^+. It could not be found out whether $l_n = 3$ or $l_n = 1$ For the 1.58 Mev and 2.8 Mev levels $l_n = 1$ or 0, the quantum characteristics are 2^+, 3^+, 4^+, 5^+, and 3^- and 4^-. For Sr^{88} the authors determine $l_n = 2$ for the ground state, and $l_n = 0$ for the first excited state. The values of the quantum characteristics are $3/2^+$ or $5/2^+$, and $1/2^+$. The authors finally thank M. V. Pasechnik for his interest in this paper, Yu. A. Bin'kovskiy for the production of the targets, Yu. V. Gofman and V. N. Dorbikov for their assistance in measurements. There are 8 figures, 1 table, and 13 references: 1 Soviet, 2 British, and 10 US.

ASSOCIATION: Institut fiziki Akademii nauk USSR (Institute of Physics of the Academy of Sciences, UkrSSR)

Card 2/2

S/048/60/024/00[illegible]/024/032/XX
B019/B056

24.6600

AUTHORS: Nemets, O. F. and Prokopets, G. A.

TITLE: The Spin of the Mg^{24} Level With an Excitation Energy of 1.38 Mev

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya. 1960, Vol. 24, No. 7, pp. 869-871

TEXT: This paper was read at the 10th All-Union Conference on Nuclear Spectroscopy, which took place from January 19 to January 27 1960 at Moscow. By a detailed study of the angular distribution of the inelastically scattered deuterons and protons, the authors attempted to determine the spin of the 1.38-Mev level of Mg^{24}. The measurements were carried out within an angular interval of from 2.5° to 140°. The angular intervals in the case of small angles were 2.5°, and in the case of large angles 5°. The statistical error in the determination of the relative cross sections in the case of large angles was 15%, and in the case of small angles 25%. As a target an Mg-foil with a thickness of 1.4 mg/cm^2 was used. In Fig. 1, the angular distribution of the inelastically scattered deuterons is shown.

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The Spin of the Mg^{24} Level With an Excitation Energy of 1.38 Mev

S/048/60/024/007/024/032/XX
B019/B056

Curve 1 shows the measured values obtained by the authors, curve 2 is the curve theoretically calculated (direct interaction) by Huby and Newns (Ref. 13), and curve 3 shows the angular distribution calculated by Mullin and Guth (Ref. 7). The authors show the peak at 20° to be in agreement with the theory by V. I. Mamasakhlisov and T. I. Kopalevshvili (Ref. 14), and relate it with the general properties of the Mg^{24} nuclei. The best agreements between theory and experiment are obtained for curve 2 in the case of an interaction radius $a = 6.3 \cdot 10^{-13}$ cm and for curve 3 with $a = 15.8 \cdot 10^{-13}$ cm. The theoretical peak at a scattering angle of 20° with $a = 7 \cdot 10^{-13}$ cm agrees with the experiment. From the results obtained, the authors draw the conclusion that in the inelastic scattering of 13.6 Mev deuterons the direct interaction predominates. Further, they conclude that the given Mg^{24} level possesses the quantum characteristic of 2^+. From the angular distribution of the inelastically scattered protons shown in Fig. 2, the authors draw the conclusion that the scattering in medium and large angles takes place via the formation of a compound nucleus. The best agreement between theoretical and experimental results is obtained by assuming an electric interaction ($a = 24.7 \cdot 10^{-13}$ cm). There are 2 figures

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80556

The Spin of the Mg^{24} Level With an Excitation Energy of 1.38 Mev

S/048/60/024/007/024/032/XX
B019/B056

and 15 references: 2 Soviet and 13 US.

ASSOCIATION: Institut fiziki Akademii nauk USSR (Institute of Physics of the Academy of Sciences, UkrSSR)

X

Card 3/3

24.6600

S/048/60/024/007/025/032/XX
B019/B056

AUTHORS: Zaika, N. I., Nemets, O. F., and Prokopenko, V. S.

TITLE: Spins and Parities of Ca^{41} Levels

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 7, pp. 872-873

TEXT: This paper was read at the 10th All-Union Conference on Nuclear Spectroscopy, which took place in Moscow from January 19 to 27, 1960. By means of a deuteron beam (E_d = 13.6 Mev) obtained from a cyclotron, the proton angular distribution in the reaction $Ca^{40}(d,p)Ca^{41}$ for the ground level and the excited levels at 1.95 and 2.42 Mev were studied. The angular distribution of protons from the reaction $Ca^{40}(d,p)Ca^{41}$ is shown in Fig. 1 (Q = 6.14 Mev, l_n = 3). In Fig. 2 the same is shown for Q = 4.18 Mev and l_n = 1, and in Fig. 3 for Q = 3.69 Mev and l_n = 1. The curves plotted were calculated according to Butler (Ref. 3), an interaction radius of $a = 6.10^{-13}$ cm being assumed. As the quantum characteristic of the Ca^{40} level is 0^+, the authors draw the conclusion that the quantum characteris-

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Spins and Parities of Ca^{41} Levels

S/048/60/024/007/025/032/XX
B019/B056

tic of the two Ca^{41} states is 5/2 or 7/2; $1/2^-$ or $3/2^-$; and $1/2^-$ or $3/2^-$, respectively. The shell model indicates $7/2^-$, $3/2^-$, and $1/2^-$. There are 3 figures and 7 references: 3 Soviet, 3 US, and 1 British.

ASSOCIATION: Institut fiziki Akademii nauk USSR (Institute of Physics of the Academy of Sciences UkrSSR)

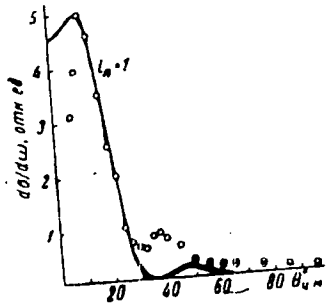

Рис. 3. Угловое распределение протонов из реакции $Ca^{40}(d,p)Ca^{41}$; $Q = 3{,}69$ MeV, $l_n = 1$

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B019/B056

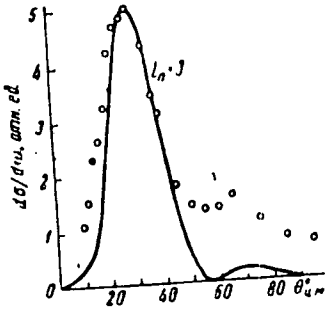

Рис. 1. Угловое распределение протонов из реакции $Ca^{40}(d,p)Ca^{41}$; $Q = 6{,}14$ MeV, $l_n = 3$

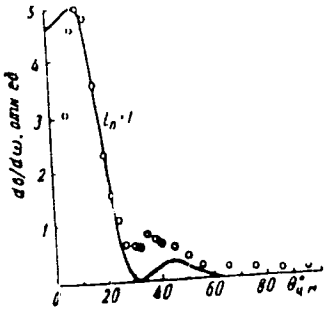

Рис. 2. Угловое распределение протонов из реакции $Ca^{40}(d,p)Ca^{41}$; $Q = 4{,}18$ MeV, $l_n = 1$

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ZAIKA, N.I.; NEMETS, O.F.; PROKOPENKO, V.S.

Angular distribution of protons from the reaction $Ca^{40}(d, p)Ca^{41}$. Zhur. eksp. i teor. fiz. 38 no.1:287-289 Jan '60. (MIRA 14:9)
(Protons) (Nuclear reactions) (Calcium--Isotopes)

S/056/60/038/03/04/033
B006/B014

24.6600

AUTHORS: Nemets, O. F., Prokopets, G. A.

TITLE: Inelastic Scattering of Protons and Deuterons by Mg^{24}

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 3, pp. 693-696

TEXT: As confirmed by investigations of inelastic proton scattering by Mg^{24} (Refs. 8-10), the formation of compound nuclei also plays an important part in addition to direct interaction in the energy range 7.3 - 18 Mev. Experiments at 7.5, 8.9, and 15 Mev showed (Refs. 11-13) that direct interaction predominates. Little attention is drawn by previous authors to the ranges of small angles; however, just these small angles make important contributions (Ref. 13). For this reason, the authors of the article under consideration carried out a detailed investigation of the angular distribution with special regard to small angles. The investigations were performed on the cyclotron of the Institut fiziki AN USSR (Institute of Physics, AS UkrSSR). An ionization chamber served as spectrometer. The experimental setup is

Inelastic Scattering of Protons and Deuterons by Mg^{24}

S/056/60/038/03/04/033
B006/B014

schematically shown in Fig. 1. The statistical errors amounted to 15 per cent for large angles and to about 25 per cent for small ones. At angles smaller than 12.5° in the case of deuterons and smaller than 15° in the case of protons the results are qualitative in nature on account of the background. A free magnesium foil (thickness: 1.4 mg/cm^2) served as target. Fig. 2 shows the angular distribution of inelastically scattered deuterons (13.6 Mev), and for comparison, an experimental (Ref. 13; curve 4) and two theoretical distribution curves (Refs. 2,6; curves 2,3). The peak at 20° is in agreement with the theory established by Mamasakhlisov and Kopaleyshvili (Ref. 3). The angular distribution was studied in the range 2.5 - 140°; a comparison between experiment and theory reveals that in inelastic scattering the 1.37-Mev level (2^+) of the Mg^{24} is excited (direct interaction). Fig. 3 demonstrates the angular distribution of 6.8-Mev protons inelastically scattered by Mg^{24}; for a comparison, see a theoretical curve (2) for direct interaction with the surface ($2.2\,P_0 + P_7$) and a theoretical curve (3) for electric interaction with the surface ($l = 2$, $a = 24.7 \cdot 10^{-13}$ cm), and experimental data (curve 4, Ref. 8). The results are not in good agreement

Inelastic Scattering of Protons and Deuterons by Mg^{24}

with theory. The results obtained for small values seem to indicate an unknown interaction mechanism, however, the results are qualitative in nature in the small-angle region A comparison with theory discloses that the direct interaction is the most essential one. In conclusion, the authors thank M. V. Pasechnik for his interest in the experiments, and Yu. A. Bin'kovskiy for preparing the target. There are 3 figures and 15 references, 4 of which are Soviet.

ASSOCIATION: Institut fiziki Akademii nauk USSR (Physics Institute of the Academy of Sciences, UkrSSR)

SUBMITTED: August 22, 1959

Card 3/3

S/056/60/038/006/014/049/XX
B006/B070

21 1700
26.2246

AUTHORS: Nemets O F , Saltykov L S , Sokolov, M V

TITLE. The (p,d) Reaction^{10} and the Inelastic Scattering of Protons From Be^{9} ^{19}

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol 38, No 6, pp 663 - 1664

TEXT: The angular distribution of protons inelastically scattered from Be^{9} nuclei, and of deuterons from the reaction $Be^{9}(p,d)Be^{8}$ have been measured, the reaction being induced by 6 8-Mev protons The object of the study was to determine the spin and parity of Be^{9} levels whose knowledge is of importance for choosing the nuclear model for Be^{9} The experiments were carried out on the cyclotron of the Institut fiziki AN USSR (Institute of Physics of the AS UkrSSR) in the same way as in Ref 8; only a H_2 ion beam was used and a scintillation spectrometer was employed instead of an ionization chamber The thickness of the Be target was 4 mg/cm^2 The measured

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85672

The (p,d) Reaction and the Inelastic Scattering of Protons From B^9

C/0:6/60/033/006/014/048/XX
B006/B070

angular distribution of the inelastically scattered protons in c m s is shown in Fig ' (Curve ') Curve 2 shows the results of calculation for the case of a direct interaction with r_0=4 10^{-13}cm; Curve 3 shows the results of calculation for the case of a direct excitation of the rotational levels in the alpha-particle model (r_0 = 6 10^{-13}cm)

In the first case the 2.43-Mev level must have a positive parity and in the second case a negative one The theoretical and experimental curves, however, do not agree so well that the parity of the state can be determined Also there is no theory of the increase of cross section for small angles which connects the electrical interaction of the proton with the nucleus Fig (Curve ', shows the angular distribution of deuterons from the reaction Be^9(p,d)Be^8; the theoretical curves are again given for comparison Curve 2 is calculated for the case when the proton interacts only with the unpaired neutron; Curve 3 is calculated in Born approximation The orbital momentum of the neutron was assumed to be in accordance

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85672

The (p,d) Reaction and the Inelastic Scattering of Protons From Be^9

S/056/60/038/006/014/049
B006/B070

with the spins of the ground states of Be^9 and Be^8 ($3/2^-$ and 0^+). The results of deuteron distribution agree well with other measurements of proton energies. Professor M. V. Pasechnik is thanked for his interest, and Yu. A. Bin'kovskiy for preparing the target. There are 2 figures and 13 references: 2 Soviet, 9 US, 1 Italian, and 1 British.

ASSOCIATION: Institut fiziki Akademii nauk Ukrainskoy SSR (Institute of Physics of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: December 13, 1959

Card 3/5

S/056/60/039/006/044/049/XX
B006/B070

Fig. 1

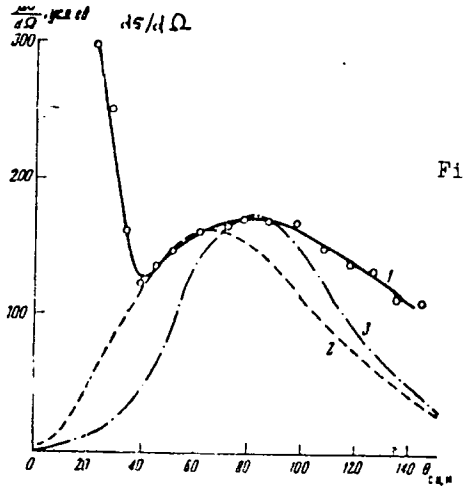

Рис. 1

Fig. 1

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APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001136520008-5"

S/056/60/038/006/014/019/XX
B006/B070

Fig. 2

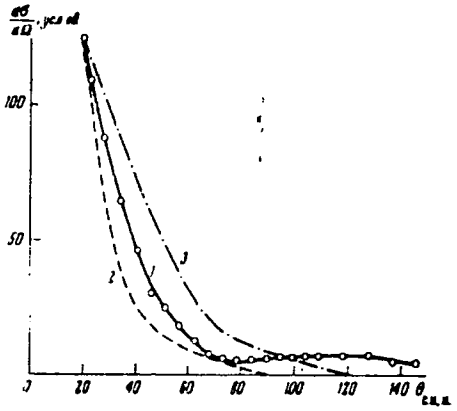

Fig. 2

Рис. 2

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84710

S/056/60/039/001/030/041/XX
B006/B056

24.6600

AUTHORS: Zaika, N. I., Nemets, O. F., Tserineo, M. A.

TITLE: The Angular Distribution of the Protons[19] in the Reaction $C^{12}(dp)C^{13}$ at Deuteron Energies of From 5 to 13 Mev

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol 39, No. 1(7), pp. 3-6

TEXT: The authors measured the angular distributions of protons (corresponding to the C^{13} ground state) at the following deuteron energies: 13.3 ± 0.2, 12.1 ± 0.2, 9.55 ± 0.2, 7.15 ± 0.2, and 4.65 ± 0.2 Mev (Fig. 1) as well as of protons (corresponding to the three lowest excited states of C^{13}) at deuteron energies of 13.3 ± 0.2 and 12.1 ± 0.2 Mev (Figs. 2, 3). The authors worked with a 13.6-Mev deuteron beam from the cyclotron of the Institut fiziki AN USSR (Institute of Physics of the AS UkrSSR). The experimental arrangement was the same as described in Ref. 6. From a comparison of the experimentally obtained angular distributions with the theory, the following spin values could be ascribed to the ground state and to the first three excited states of C^{13}:

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The Angular Distribution of the Protons in the Reaction $C^{12}(dp)C^{13}$ at Deuteron Energies of From 5 to 13 Mev

S/056/60/039/001/030/041/XX
B006/B056

$1/2^- - 3/2^-$, $1/2^+$, $1/2^- - 3/2^-$, $3/2^+ - 5/2^+$ Whereas the proton distributions corresponding to the excited states correspond to the Butler theory, that of the ground state protons has a number of peculiarities. Thus, the proton distributions recorded at 4.65 and 7.15 Mev deuteron energies, deviate from those recorded at 9.55, 12.1, and 13.3 Mev (the latter show two additional peaks at large angles). It is assumed that the change in the shape of the angular distributions within the region of 7-9 Mev is interrelated with the change in the contribution of various mechanisms to the reaction, and also with the change in the ratio between nuclear and Coulomb interactions. At $E_d \leq 7.15$ Mev, it is assumed that the formation of a compound nucleus increases and the stripping of heavy particles increases, and leads to an enlargement of the cross section and a broadening of the peak at large angles. The authors also measured the differential cross section of the reaction $C^{12}(dp)C^{13}_{gr.\ state}$ for angles which correspond to the distribution maxima at ~7.15, 9.55, 12.1, and 13.3 Mev The following values were obtained: 24, 18, 14, and 13 mb/steradian (±30%). The authors finally thank Professor M. V. Pasechnik for his interest, A. M. Korolev and Yu. V. Tsekhmistrenko for discussions. There are

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84710

The Angular Distribution of the Protons in the Reaction $C^{12}(dp)C^{13}$ at Deuteron Energies of From 5 to 13 Mev

S/056/60/039/001/030/041/XX
B006/B056

3 figures and 11 references 2 Soviet, 1 British and 8 US.

ASSOCIATION: Institut "Rudzher Boshkovich", Zagreb, Yugoslaviya
(Institute "Rudzher Boshkovich", Zagreb Yugoslavia)
Tserineo, M. A.

SUBMITTED: December 11, 1959

Card 3/3

S/056/60/039/006/021/022
B006/B056

AUTHORS: Gofman, Yu. V., Nemets, O. F.

TITLE: Elastic Scattering of 13.6-Mev Deuterons by Nuclei. I

PERIODICAL: Zhurnal eksperimental'noy teoreticheskoy fiziki, 19[illegible],
Vol. 39, No. 6 (12), pp. 1489 - 1491

TEXT: The causes of the deviation of the elastic scattering cross section of deuterons from the Rutherford cross section have hitherto not been explained. In order to obtain additional data on the mechanism of elastic scattering, the authors measured the angular distributions of 13.6-Mev deuterons scattered elastically from Fe, Ni, Cu, Ag, Sn, Pt, Au, and Pb nuclei in the range of 10 - 140°; measurements were carried out every 2.5 - 5°. The deuteron beam originated from the cyclotron of the Institut fiziki AN USSR (Institute of Physics AS UkrSSR); the experimental method is described in Ref. 6. The targets were free metal foils [illegible] mg/cm^2 thick, with the exception of lead (4.7 mg/cm^2). The angular distributions obtained are shown in Fig. 1 (σ/σ_{Ruth}). In heavy nuclei (Pb, Au, Pt), a deviation from the Coulomb scattering occurs at 35 - 40°. The mechanism

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of this deviation is briefly discussed. For the three heavy nuclei, the decrease of the cross section relative to that of Rutherford at angles of up to 60° is explained by electrical splitting of the deuteron. In lighter nuclei, a deviation from the Rutherford scattering at angles below 40° may be observed. In general, the angle at which the deviation is observed also decreases with decreasing Z. The authors thank Yu. A. Bin'kovskiy for target preparation, and V. N. Dobrikov and N. I. Zaika for their help in measurements. There are 2 figures and 6 references: 1 Soviet, 4 US, and 1 Japanese.

SUBMITTED: April 9, 1960 (initially) and August 29, 1960 (after revision)

S/056/60/039/006/031/063
B006/B056

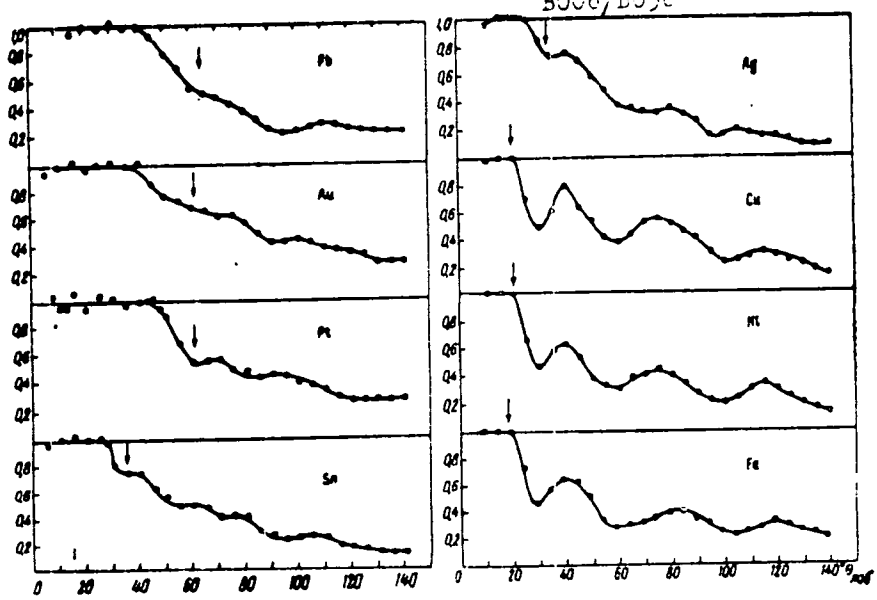

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Рис. 1

NEMETS, O. F., Dr. Phys-Math. Sci. (diss) "Some Questions of Mutual Interactions of Deutrons with Nuclei," Khar'kov, 1961, 36 pp. (Khar'kov State Institute im A. M. Gor'kiy), 200 copies (KL Supp, 16-61, 243).

20688
S/120/61/000/001/024/062
E032/E114

9.4130 (1138, 1141, 2801, 3201)

AUTHORS: Kosinov, G.A., Nemets, O.F., Saltykov, L.S., and Sokolov, M.V.

TITLE: A Device for the Selection and Adjustment of Photomultipliers

PERIODICAL: Pribory i tekhnika eksperimenta, 1961, No. 1, p 78

TEXT: The principle of the device is illustrated in Fig.1. Light from the lamp 1 passes through the slit 2 the collecting lens 3, and finally reaches the mirror 4 which is rotated by an electric motor. The reflected ray falls on the photomultiplier 6 through the slit 5. The focal length and the position of the lens are chosen so that the image of the light source in the plane of the photocathode has the required dimensions and brightness. The mirror (5 x 8 mm^2) is rotated by a MM-1 (MM-1) motor, working off the audio-oscillator ZG-10 (ZG-10). The speed of the motor can be varied between 4800 and 25600 rpm when the oscillator frequency is varied from 1200 to 2000 cps and the supply voltage from 1 to 6 V. The angular velocity of the motor is independent of the supply voltage

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20638

S/120/61/000/001/024/062
E032/E114

A Device for the Selection and Adjustment of Photomultipliers

(between 4 and 6 V) which ensures that the length of the leading edge and the amplitude of the light pulse remain constant. Figs. 2 and 3 show photographs of pulses obtained at the maximum angular velocity of the motor. Fig.2 was obtained with a circular diaphragm, 3 mm in diameter, and Fig.3 with a 0.1 mm slit (both at 5 in Fig.1). In these figures one division corresponds to 0.27 μsec. Thus, the device is capable of producing light flashes with leading edges $\tau \geqslant 0.05$ μsec, repetition frequency $\nu \leqslant 420$ sec^{-1}, and amplitude equivalent to a scintillation produced in a sodium iodide crystal irradiated with particles of a few MeV.
There are 3 figures.

ASSOCIATION: Institut fiziki AN USSR
(Physics Institute, AS Ukr.SSR)

SUBMITTED: December 2, 1959

Card 2/4

20688

S/120/61/000/001/024/062
E032/E114

A Device for the Selection and Adjustment of Photomultipliers

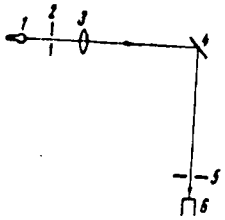

Fig. 1

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20688

S/120/61/000/001/024/062
E032/E114

A Device for the Selection and Adjustment of Photomultipliers

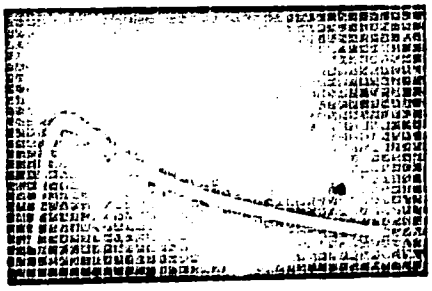

Fig. 2

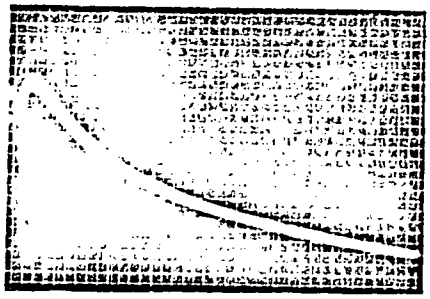

Fig. 3

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BIN'KOVSKIY, Yu.A.; NEMETS, O.F.; STEPANENKO, V.A.

Vacuum deposition of films without base layers. Prib.i tekh.eksp. 6 no.5:190 S-O '61. (MIRA 14:10)

1. Institut fiziki AN USSR.
(Metallic films)

NEMETS, O.F.; TOKAREVSKIY, V.V.

Spins and parities in certain states of Cd^{112}, Sn^{118}, and Sn^{120}. Izv. AN SSSR. Ser. fiz. 25 no.9:1138-1140 '61. (MIRA 14:8)

1. Institut fiziki AN USSR.
(Cadmium--Isotopes)
(Tin--Isotopes)

GOFMAN, Yu.V.; DOBRIKOV, V.N.; ZAIKA, N.I.; NEMETS, O.F.

Application of an ionization chamber for particle selection by the method of measuring $E\frac{dE}{dx}$. Izv.AN SSSR.Ser.fiz. 25 no.10: 1305-1307 O '61. (MIRA 14:10)

1. Institut fiziki AN USSR
(Ionization chambers)

ZAIKA, N.I.; NEMETS, O.F.

Spin values and parities of certain states of Si^{30}, Zr^{91}, Zr^{92}, and Cd^{114} nuclei. Izv.AN SSSR.Ser.fiz. 25 no.10:1308-1312 O '61. (MIRA 14:10)

1. Institut fiziki AN USSR.
(Nuclear reactions) (Isotopes)

S/056/61/040/002/014/047
B 102/B202

AUTHORS: Gofman, Yu.V., Nemets O.F.

TITLE: Elastic scattering of [illegible] Mev deuterons from nuclei. II

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 2, 1961, [illegible]

TEXT: Using a [illegible]-Mev deuteron beam from the cyclotron of the Institut fiziki AN USSR (Institute of Physics AS UkrSSR) the authors studied the angular distributions of deuterons elastically scattered from different nuclei. Measuring technique and preparation of the targets are described in Refs. 1 and 2 (Izv. AN SSSR, ser. fiz. [illegible], no. 1959 and ZhETF, 39, 1489, 1960). The half width of the elastic peak was 2.0 - 3.0% for angles of up to 90°, and the statistical error in measurement was 1%. Since in Al, Si, and C the deviation from the Rutherford scattering occurs already at small angles the absolute cross sections were measured for these nuclei at 45° and 90°. Results are illustrated in diagrams. The arrows give those values of $\theta_{c.m.}$ at which nuclear interaction occurs. No agree

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S/056/61/040/002/014/047
B102/B202

Elastic scattering of

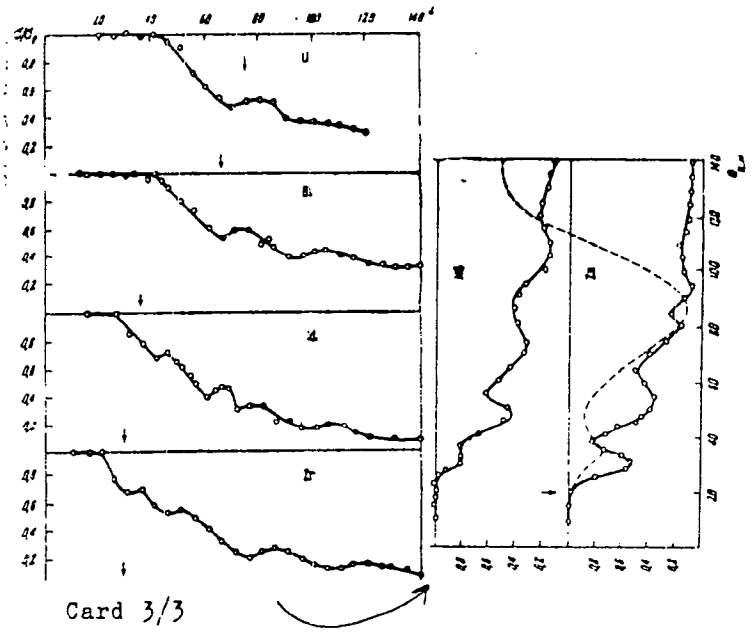
ment was obtained by a comparison of the angular distribution of the neutrons scattered from Zn with that calculated with the aid of the optical model with square well potential (dashed curves). The following parameters were assumed for this curve: $V = 50$ Mev, $W = 10$ Mev, $r_c = 1.2 \cdot 10^{-13}$ cm. Using a potential well with round-off edges M A Melkanoff (Proc. Int. Conf. on the Nucl. Optical Model. Florida State University, 1959, p. 207) succeeded in obtaining a better agreement at A. with $E_1 = 5$ Mev for angles of up to 100°. [Abstracter's note: Essentially complete translation]. There are 1 figure and 4 references: 1 Soviet-bloc and 3 non-Soviet-bloc

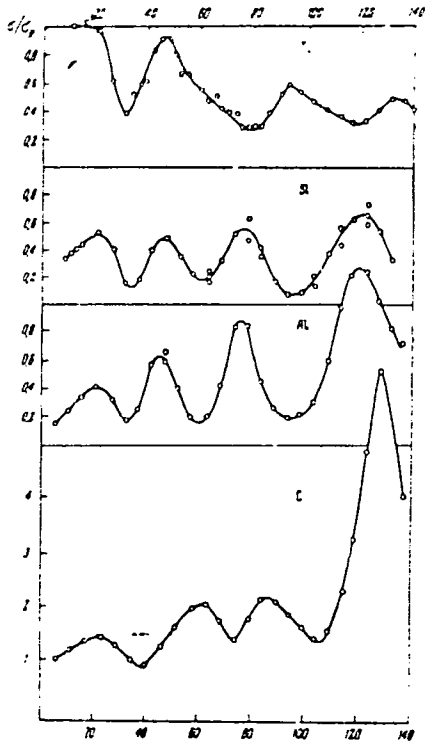
SUBMITTED September [illegible]

Card 2/3

S/056/61/040/002/014/047

Elastic scattering of...





Card 3/3

ZAIKA, N.I.; NEMETS, O.F.

Stripping reactions on Zr^{90} and Zr^{91} nuclei. Zhur. eksp. i teor. fiz. 40 no.4:1019-1021 Ap '61. (MIRA 14:7)

1. Institut fiziki AN Ukrainskoy SSR.
(Nuclear reactions) (Zirconium--Isotopes)

KOSINOV, G. A.; NEMETS, O. F.

Measurement of the pγ-angular correlation in the reaction Be^9 (d, pγ)Be^{10}. Izv. AN SSSR. Ser. fiz. 16 no.12:1518-1520 D '62. (MIRA 16:1)

(Nuclear reactions) (Spectrometry)

4428

S/048/62/026/012/013/016
B117/B102

AUTHORS: Kosinov, G. A., and Nemets, O. F.

TITLE: Measuring the $p\gamma$-angular correlation in the reaction $Be^9(d,p\gamma)B^{10}$

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 12, 1962, 1518 - 1520

TEXT: The $p\gamma$-angular correlation was measured when bombarding an 8mg/cm^2 thick Be^9-target with 15.6-Mev deuterons from the cyclotron of the Institut fiziki AN USSR (Institute of Physics AS UkrSSR). The measurements were made with on a device consisting of a reaction chamber, two scintillation spectrometers and fast and slow-coincidence circuits. The reaction chamber was composed of two cylinders welded together at right angles. The proton spectrometer (resolution 5.5-4% for 6.8-Mev protons, distance from target 11 cm) and the γ-spectrometer (resolution 6-7% for the second Co^{60} line, distance from target adjustable from 11 to 25 cm), each contained ФЭУ-13 (FEU-13) photomultipliers and NaI(Tl)-crystals and were able to rotate

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around the axis of one cylinder. The second cylinder of the reaction chamber, mounted in guides, could turn the whole system in the vertical plane around the center of the chamber. The system described allows of measuring the angular correlation within the following ranges: In the reaction plane from -155 up to +155°; in the plane perpendicular to the recoil axis from -155 to +155° or 360° depending on the angle between the directions of the recoil and the deuteron beam. For fast coincidences, the coincidence circuit proposed by Bell et al. (R. E. Bell, R. L. Graham, H. E. Petch, Canad. Phys., 30, no. 1, 35 (1952)) was used, giving a time resolution 6.10^{-9} sec. To relieve the system amplifiers of the type УИС-2 (UIS-2) with double pulse formation and single-channel pulse-height analyzers of the type ДДД-1 (DDD-1) were used. To measure the pγ angular correlation in the reaction investigated, which leads to the 3.37-Mev excited state, the proton counter was adjusted to make an angle of 15° with the direction of the proton beam. The results could be expressed by the equation: $W(\Theta) = 1 - (0.38 \pm 0.04)P_2(\cos\Theta)$ (Θ is the angle between the γ-counter and the recoil direction). Conclusions: The Be^9 ground state is a $3/2^-$ state. The first excited state of $Be^{10}(2^+)$ is excited in the

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S/048/62/026/012/013/016
B117/B102

Measuring the p,γ-angular ...

neutron capture with $l_n = 1$ and de-excites to the ground state, 0^+, via an E2 γ-transition. Assuming L - S coupling the spin mixture for the spin of the entrance channel was found to consist of about 90% of spin 2 and 10% of spin 1. This paper was read on the 12th Annual Conference on Nuclear Spectroscopy in Leningrad from January 26 to February 2, 1962. There are 4 figures.

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S/056/62/042/003/003/049
B154/B108

AUTHORS: Gofman, Yu. V., Nemets, O. F., Stryuk, Yu. S.

TITLE: Inelastic scattering of 13.6-Mev deuterons from nickel isotopes

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 3, 1962, 653 - 656

TEXT: Investigations about the interaction between deuterons and nuclei do not show a satisfactory agreement between experimental results and theory. To obtain more information the authors studied deuteron scattering from the isotopes Ni^{58}, Ni^{60}, Ni^{62}, Ni^{64}. The experiments were carried out with 13.6-Mev deuterons at the cyclotron of the Institute of Physics AS UkrSSR. Fig. 2 shows the angular distribution of deuterons scattered on Ni^{58}. The other isotopes yield similar curves with maxima at 45, 75, and 115°. For Ni^{60}, and probably for Ni^{62}, a small maximum appears also in the angular range of 25 - 30°. The peak intensity clearly varies from isotope to isotope. For Ni^{58} and Ni^{62} sharp peaks

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are obtained at 45 and 75°. Ni^{60} and Ni^{64} have clearer peaks at 115°. These results do not show perfect agreement with the theory of electric or nuclear interaction between deuterons and nuclei (Refs. 4 and 5, see below). The authors conclude that it is not possible to apply any of the known mechanisms with preference to inelastic scattering of deuterons described in the present paper. It is stated that in the range of small angles the electric interaction between deuterons and nuclei is predominant. This conclusion is confirmed by the fact that in contrast to previous works (Ref. 13: O. F. Nemets, G. A. Prokopets. ZhETF, 38, 693, 1960.; Ref. 14) good agreement with the theory is obtained if the parameter r is properly chosen. There are 5 figures and 14 references: 6 Soviet and 8 non-Soviet. The 4 most recent references to English-language publications read as follows: J. S. Blair, Phys. Rev., 115, 928, 1959; Ref. 4: R. Huby, H. C. Newns, Phil. Mag., 42, 1442, 1951; Ref. 5: C. J. Mullin, E. Guth, Phys. Rev., 82, 141, 1951.; Ref. 14: J. W., Haffner, Phys. Rev., 103, 1398, 1956.

ASSOCIATION: Institut fiziki Akademii nauk Ukrainskoy SSR (Institute of Physics of the Academy of Soiences Ukrainskaya SSR)

S/056/62/042/003/002/049
B154/B108

AUTHORS: Gofman Yu. V., Nemets O. F.

TITLE: Elastic scattering of deuterons. III

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 3, 1962, 657 - 659

TEXT: The angular distribution of 6.6-Mev protons elastically scattered from the isotopes Ni^{58}, Ni^{60}, Ni^{62}, Ni^{64} and of 7.5 and 17Mev protons elastically scattered from nuclei with near values of Z show that the differential cross section for wide angles varies considerably from isotope to isotope. To get information on the behavior of deuterons, the authors studied the elastic scattering of 13.6Mev deuterons on the mentioned Ni isotopes. The spectrum of deuterons scattered through an angle of 35° show a satisfactory form. Fig. 2 shows the angular distribution of 13.6-MeV deuterons elastically scattered from Ni^{58}, Ni^{60}, Ni^{62}, Ni^{64}. The Ni targets were enriched between 94 and 98%. Their thickness was between 2.16 and 3.37 mg/cm^2. In the range of large angles essential fluctuations

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Elastic scattering of ...

in the differential cross-section from isotope to isotope were not observed. The results show that even if the shape of the surface potential of the nuclei does change with increasing number of neutrons this effect is so small that it cannot be observed in scattering. In a private note Klyucharev has stated that at large angles the fluctuation of the cross section of elastic proton scattering which is associated with the change of the (p, n) reaction threshold from isotope to isotope can be explained as the result of a competition between these reactions. For scattered deuterons this interpretation demands the absence of such differences in the cross sections as it was found in experiments. In this case however it is necessary to assume that for elastic scattering of protons a great part of this process serves for the production of a compound nucleus. Comparison with other experiments (Ref. 3) confirms this assumption. There are 2 figures and 4 references: 2 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: J.Dayton, G. Schrank, Phys. Rev., 101, 1358, 1956.; Ref. 3: W.Waldorf, N. Wall, Phys. Rev., 107, 1602, 1957.

Card 2/3

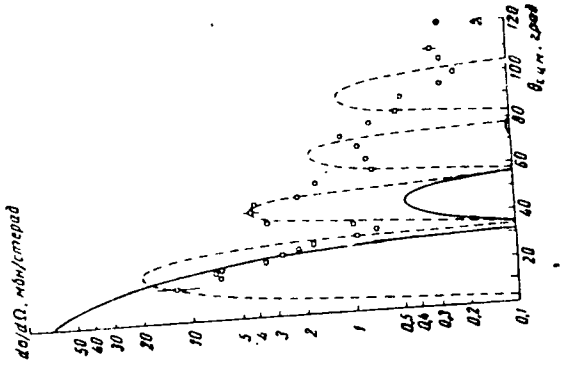
S/056/62/042/003/002/049
B154/B108

Elastic scattering of ...

ASSOCIATION: Institut fiziki Akademii nauk Ukrainskoy SSR (Institute of Physics of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: July 17, 1961

Fig. 2. Angular distributions of deuterons elastically scattered on nuclei of nickel isotopes



Card 3/3

S/056/62/042/004/014/037
B163/102

24 6600

AUTHORS: Gofman, Yu. V., Nemets, O. F.

TITLE: Inelastic scattering of deuterons from Si, Ti and Fe nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 4, 1962, 1013-1016

TEXT: The experimental method used has been described earlier in more detail by the same authors for deuteron scattering from different Ni isotopes (ZhETF v. 42, 1962, 653) is based on the simultaneous measurement of the energy E and the energy loss dE/dx for the scattered charged particles. The angular distribution of the scattered deuterons was measured for Si^{28} (Q = 1.8 Mev), Ti^{48} (Q = -0.99 Mev), and Fe^{56} (Q = -0.85 Mev) with a primary deuteron energy of 13.6 Mev. The agreement with theoretical data is poor. The increased cross sections for small scattering angles may be explained by electrical interactions. There are 3 figures.

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S/056/62/042/004/014/037
B163/B102

Inelastic scattering of ...

ASSOCIATION: Institut fiziki Akademii nauk Ukrainskoy SSR (Physics Institute of the Ukrainskaya SSR)

SUBMITTED: November 25, 1961

Card 2/2

S/056/62/042/006/011/047
B104/B102

AUTHORS: Nemets, O. F., Tokarevskiy, V. V.

TITLE: The "gross structure" of the proton spectra in stripping reactions

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 6, 1962, 1481 - 1487

TEXT: In order to study the "gross structure" of the proton energy spectra, the (d,p) stripping reactions on Fe^{56}, $Cu^{63,65}$, Zn, Se, Zr, Nb^{93}, $Ag^{107,109}$, $Cd^{111,116}$, $Sn^{116-120,124}$, Pt, Au^{196}, Pb^{208}, and Bi^{209} nuclei were investigated. Measurements were made with an external 13.6 Mev deuteron beam of the cyclotron of the Institut fiziki AN USSR (Institute of Physics AS UkrSSR). The targets were unbacked films of between 2 and 6 mg/cm^2 thickness. The differential cross section of the stripping reaction as function of the energy liberated exhibits maxima. There is a clear relationship between the positions of the maxima of this gross structure and the strongly excited levels of the nuclei. Many levels correspond to each

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S/056/62/042/006/011/047
B104/B102

The "gross structure"...

maximum of the gross structure. As the nuclear shells progressively become filled the energy liberated in the transition of the residual nucleus to the ground state decreases. The maxima of the neutron spectra are coordinated with an excitation of the single-particle states of the nuclei. There are 3 figures and 1 table.

SUBMITTED: January 30, 1962

Card 2/2

VAL'TER, Anton Karlovich; ZALYUBOVSKIY, Il'ya Ivanovich; NEMETS, O.F., prof., otv. red.; VAYNBERG, D.A., red.

[Nuclear physics] IAdernaia fizika. Khar'kov, Izd-vo Khar'kovskogo univ., 1963. 367 p. (MIRA 17:5)

L 11397-63 EWT(m)/BDS AFFTC/ASD

S/120/63/000/002/006/041

AUTHOR: Kamets, O. F., Strunkho, B. G., and Tukarevskiy, V. V.

TITLE: Selective scintillation spectrometer for charged particles

PERIODICAL: Pribory i tekhnika eksperimenta, March-April 1963, v. 8, no. 2, 34-36

TEXT: The article describes a spectroscope capable of simultaneously measuring the specific ionization losses (dE/dx) and the total energy (E) of charged particles by means of two CsI(Tl) crystal scintillation spectrometers in the same housing. The energy resolution of the spectrometer is 3-3.5 percent and it may be used for conducting measurements beginning with very small angles. There are five figures.

ASSOCIATION: Institut fiziki AN USSR (Physics Institute, Academy of Sciences Ukrainian SSR)

SUBMITTED: June 19, 1962

Card 1/1

L 17186-63 EWP(q)-2/EWT(m)/BDS AFFTC/ASD/SSD Pu-4

S/0185/63/008/005/0505/0522

ACCESSION NR: AP3000229

AUTHOR: Nemets, O. F.

59
38

TITLE: Interaction of deuterons with nuclei

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 8, no. 5, 1963, 505-522

TOPIC TAGS: deuteron scattering, inelastic scattering, stripping, deuteron, spin flip stripping, magnetic spectrometer, elastic scattering

ABSTRACT: This is a review of deuteron-nucleus interactions at energies below about 25 MeV. The sections are entitled: Detecting Apparatus, Elastic Scattering, Inelastic Scattering, Stripping Reactions, and Other Types of Reactions. Many deuteron-nucleus reaction mechanisms are discussed in terms of theoretical and phenomenological models, which are evaluated in terms of experimental data for angular distributions in scattering, angular correlations and energies involved. Mechanisms such as spin-flip, spin-orbit coupling and polarization, are discussed in the section on stripping reaction. It is suggested that the magnetic spectrometer is the most promising device for the study of energy spectra

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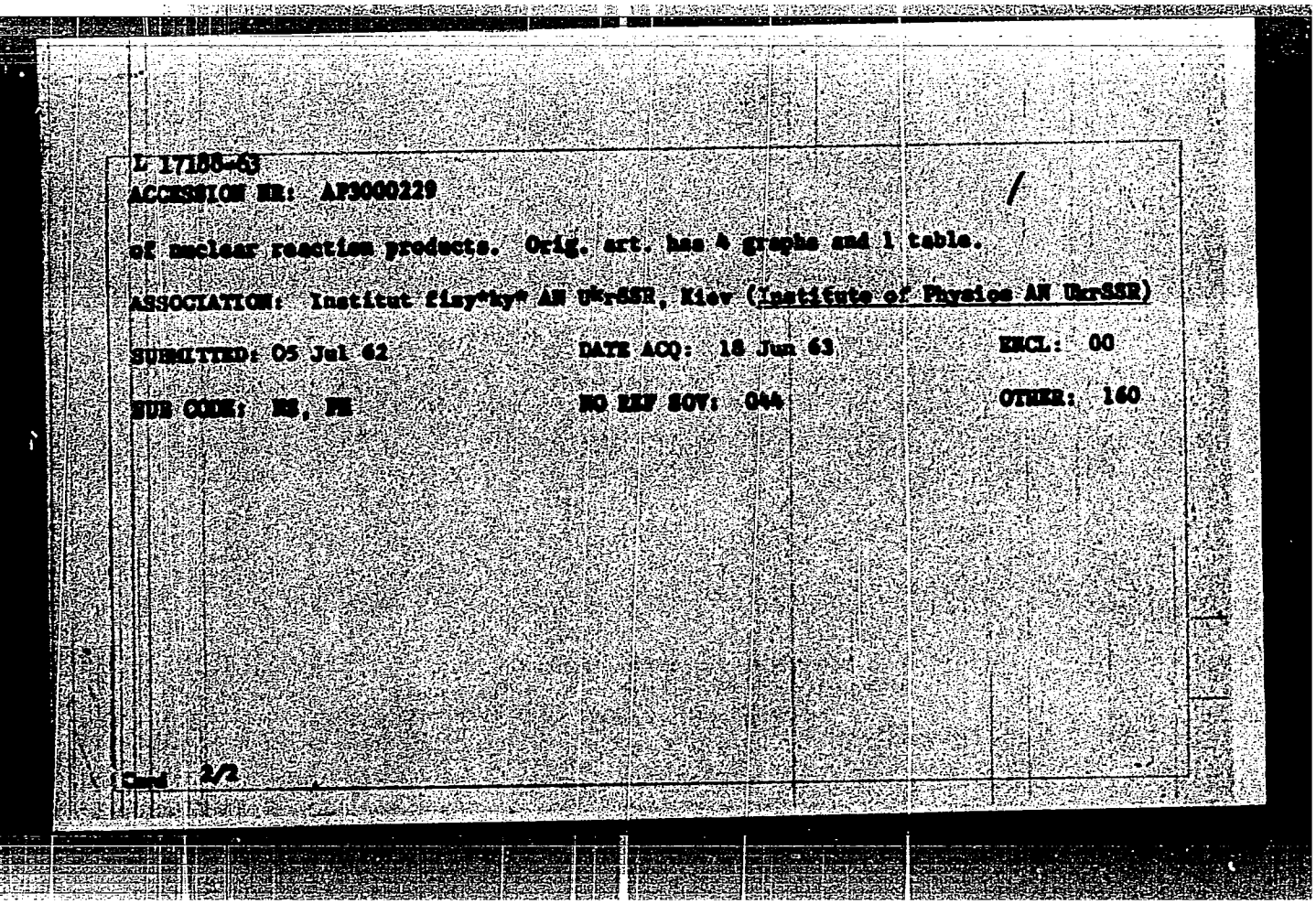

L 17188-63
ACCESSION NR: AP3000229

of nuclear reaction products. Orig. art. has 4 graphs and 1 table.

ASSOCIATION: Institut fiz*hy* AN U*rSSR, Kiev (Institute of Physics AN UkrSSR)

SUBMITTED: 05 Jul 62 DATE ACQ: 18 Jun 63 ENCL: 00

SUB CODE: NS, PH NO REF SOV: 044 OTHER: 160

Card 2/2

S/089/63/014/002/004/019
B102/B186

AUTHORS: Nemets, O. F., Pasechnik, M. V., Pucherov, N. N.

TITLE: Investigation of nuclear reactions at the cyclotron of the Institut fiziki AN USSR (Institute of Physics AS UkrSSR)

PERIODICAL: Atomnaya energiya, v. 14, no. 2, 1963, 159 - 170

TEXT: This paper gives a review of the investigations of the nuclear reactions carried out at the cyclotron of the Institute of Physics AS UkrSSR during the years 1957 - 1961. Pertinent material assembled by the research team was also published in various journals. Mention is made of the investigations of the elastic and inelastic scattering of 6.8-Mev protons and 13.6-Mev deuterons from different metals of natural isotopic composition as well as from separated isotopes. Furthermore the energy and angular distributions of the protons in deuteron stripping reactions, etc. were studied. The experimental material is clearly presented in tabular form. There are 6 figures, 3 tables, and 50 references.

SUBMITTED: July 19, 1962

Card 1/1

L 17665-63 EWT(m)/BDS AFFTC/ASD

ACCESSION NR: AP3003698 S/0048/63/027/007/0927/0931

AUTHOR: Nemets, O.F.; Tokarevskiy, V.V.

TITLE: Inelastic scattering of deuterons by some chromium, zinc and tin isotopes /Report of the Thirteenth Annual Conference on Nuclear Spectroscopy, held in Kiev from 25 January to 2 February 1963/

SOURCE: AN SSSR, Izv.Seriya fizicheskaya, v.27, no.7, 1963, 927-931

TOPIC TAGS: deuteron scattering, inelastic scattering, Cr, Zn, Sn, chromium, zinc, tin

ABSTRACT: The singularities of deuterons (low binding energy, asymmetry and large radius) largely determine the particular mechanism of inelastic scattering of these particles and make it different from the scattering mechanism typical of other particles. Despite the fact that there have been numerous studies of inelastic deuteron scattering since 1949, the nature of the mechanism involved is still obscure, and, owing to the lack of an adequate theory and full data, the results of deuteron scattering experiments cannot be utilized for the purposes of nuclear spectroscopy. Hence for the purpose of obtaining additional information on inelastic scattering of deuterons the authors carried out measurements of the differential inelastic scattering cross sections for 13.6 MeV deuterons by Cr^{50} (0.78 MeV),

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L 17865-63
ACCESSION NR: AP 3003698

3

Cr^{52} (1.42 MeV), Zn^{64} (0.98 MeV), Zn^{68} (1.02 MeV), Zn^{70} (1.0 MeV) and Sn^{116} (1.2 and 2.3 MeV). The scattered deuterons were detected by means of a scintillation spectrometer, using the "dE/dx and E method". The observed angular distributions are presented in the form of curves. It is difficult to identify a predominant reaction mechanism on the basis of the results for inelastic scattering. It would appear that the conclusion of M.El-Nadi and M.Wafik (Proc.Phys.Soc.,76, 185,1960) that the predominant inelastic scattering mechanism in stripping is valid only for light nuclei in the range of medium angles. "The authors are grateful to A.P.Klyucharev for providing the isotopic targets, L.I.Slyusarenko for assistance in the work and the personnel of the Cyclotron Laboratory for insuring faultless operation of the accelerator." Orig.art.has: 7 figures and 1 table.

ASSOCIATION: Institut fiziki Akademii nauk UkrSSR (Institute of Physics, Academy of Sciences, UkrSSR)

SUBMITTED: 00 DATE ACQ: 02Aug63 ENCL: 00

SUB CODE: NS NO REF SOV: 002 OTHER: 016

Card 2/2

S/056/63/044/001/004/067
B108/B180

AUTHORS: Zaika, N. I., Nemets, O. F., Tokarevskiy, V. V.

TITLE: The spins and parities of some states of molybdenum isotopes

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 1, 1963, 17 - 21

TEXT: The angular distributions of protons emerging from (d,p) reactions on targets enriched in Mo^{92}, 94, 95, 96 were measured by means of an ionization chamber with a deuteron absorber at its input. The deuterons releasing the reaction had an energy of 13.6 Mev. The angular momenta for neutron capture in the ground, and first excited, states were obtained from the experimental data with the aid of Butler's theory (Proc. Roy. Soc., A208, 559, 1951). The possible spins and parities of these states of the Mo isotopes are considered in this way. Results: Mo^{92} - (1) $3/2^+$ or $5/2^+$, (2) $1/2^+$; Mo^{93} - (1) $5/2^+$, (2) $1/2^+$; Mo^{95} - (1) $3/2^+$ or $5/2^+$, (2) $1/2^+$; Mo^{96} - (1) from 0^+ to 5^+, (2) probably $5/2^+$; Mo^{97} - (1) $5/2^+$,

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(2) $1/2^+$ and $7/2^+$, not resolved. (1) refers to the ground level, (2) to the first excited level. It is pointed out that the (d,p) reactions are suitable for nuclear spectroscopy in the range of atomic weights around 100 at energies of 13 - 15 Mev. There are 4 figures.

ASSOCIATION: Institut fiziki Akademii nauk Ukrainskoy SSR (Physics Institute of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: June 18, 1962

L 13618-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD
ACCESSION NR: AP3003095 S/0056/63/044/006/1765/1769 61 60

AUTHOR: Val'ter, A. K.; Klyucharev, A. P.; Nemets, O. F.; Tokarevskiy, V. V.

TITLE: Elastic scattering of deuterons by chromium and zinc isotopes

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 1765-1769

TOPIC TAGS: elastic deuteron scattering, chromium isotope, zinc isotope, angular distribution, optical model, compound nucleus model

ABSTRACT: The angular distributions of 13.6-MeV deuterons elastically scattered by Cr sup 50, 52, 53, 54, and Zn sup 64, 68, 70 isotopes are measured at angles from 2.5 to 150° with the aim of studying isotopic effects for elastic scattering of deuterons, similar to studies already made for protons. The curves obtained for the ratio of the experimentally measured cross sections to the cross sections for Coulomb scattering have a diffraction nature. As the number of neutron increases, the maxima shift toward the smaller angles and the cross section begins to decrease at a higher rate with increasing angle. Comparison is made with data obtained by others. "In conclusion, the authors take this opportunity to express their gratitude to V. N. Medyanik, L. G. Lishenko, and A. D. Nikolaychuk for preparing the isotope targets, and to the cyclotron crew for uninterrupted operation of the apparatus."

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Association: Inst. of Physics, Academy of Sciences, UkrSSR

NEMETS, O.F.; PIKAR, F. [Picard, F.]; SLYUSARENKO, L.I.; TOKAREVSKIY, V.V.

Elastic deuteron scattering on nitrogen, oxygen, and argon.
Zhur. eksp. i teor. fiz. 45 no.4:850-851 O '63. (MIRA 16:11)

1. Institut fiziki AN UkrSSR. 2. Sotrudnik Laboratorii yadernoy fiziki imeni Zholio-Kyuri, Orse, Frantsiya.

GOFMAN, Yu.V.; DOBRIKOV, V.N.; ZAIKA, N.I.; MOKHNACH, A.V.; NEMETS, O.F.

Measurement of asymmetry in the $N^{14}(d,p)N^{15}$ reaction on elastically scattered deuterons. Zhur. eksp. i teor. fiz. 45 no.5:1317-1318 N '63. (MIRA 17:1)

1. Institut fiziki AN UkrSSR.

ZAIKA, N. I.; NEMETS, O. F.; TOKAREVSKIY, V. V.

"Determination by Model of the Nature of Levels of the Nucleus with the Help of Direct Reactions (d,p) and (d,d')."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

Inst Physics, AS UkSSR

BORISKOV, B. N.; NEMETS, O. F.; PIKAR, F.; SIRYUK, Yu. S.; TOKAREVSKIY, V. V.

"Investigations of the Lowest States of Mg^{25}."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

IF AN UkSSR, KGU [Inst Physics, AS UkSSR, Kiev State Univ]

NEMETS, O. F.; STRYUK, Yu. S.; TOKAREVSKIY, V. V.

"Investigations of Low-Lying States of Si^{30}."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, [illegible]
Feb 64.

Inst Physics, UkSSR, Kiev State Univ

NEMETS, O. F.; TOKAREVSKIY, V. V.; ZAYKA, N. I., Kiev

"The level excitation probabilites in nuclear reactions."

report submitted for Intl Conf on Low & Medium Energies Nuclear Physics, Paris, 2-6 Jul 64.

NEMETS, O. F.; PUDCHIK, A. T.; USIK, V. A.

"Investigations of Low-Lying States of Silicon-28 Excited in the Reaction $Al^{27}(\alpha,t)Si^{28}$."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

IF, AN UkSSR (Inst Physics, AS UkSSR)

ZAIKA, N. I.; NEMETS, O. F.; YASNOGORODSKIY, A. M.

"Investigation of Low States of Ge^{74}, Se^{78}, Zr^{93}, Zr^{95} with the Help of Stripping Reactions."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

IF, UkrSSR (Inst Physics, AS UkrSSR)

NEMETS, O.F. [Niemets', O.F.]; [illegible], L.I.; TOKAREVSKIY, V.V. [Tokarevs'kyi,

Excitation of a single-phonon quintuplet in the inelastic scattering of deuterons on copper isotopes. Ukr. fiz. zhur. 9 no.5:564-566 '64 (MIRA 17:6)

1. Institut fiziki AN USSR, Kiyev.

ACCESSION NR: AP4040929 S/0185/64/009/006/0599/0609

AUTHOR: Nemets', O. F. (Nemets, O. F.)

TITLE: Angular distribution of deuterons with 13.6 Mev energy elastically scattered by some light and medium nuclei

SOURCE: Ukrayins'ky*y fizy*chny*y zhurnal, v. 9, no. 6, 1964, 599-609

TOPIC TAGS: scattered deuteron, angular deuteron distribution, selective scintillation spectrometer, isotopic effect

ABSTRACT: The distribution of deuterons, elastically scattered by nitrogen, oxygen, argon (gas targets), isotopes $Cu^{63, 65}$, $Sr^{84, 86, 87, 88}$, $Ag^{107, 109}$, and $Sn^{116, 118, 120, 122, 124}$ has been investigated. A selective scintillation spectrometer, selecting particles according to the (dE/dx)E method was used as a detector. It was found that unlike the elastic scattering of protons, the isotopic effects are expressed very weakly. The dependence of the position of extreme points of differential cross sections of elastic

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ACCESSION NR: AP4040929

scattering on the atomic number A was plotted, including also the data of the preceding measurments performed at an energy of 13.6 mev. It also was found that both the maximum and the minimum change their position systematically and smoothly. In the region of atomic numbers A ≃ 50 anomalies are observed. In addition, depending on A, the change of $\delta(\theta)/\delta_R(\theta)$ is regular for each of extremity. Both these regularities allow predicting the angular distributions for deuterons with an energy of 13.6 mev elastically scattered by some nuclei not yet investigated. Orig. art. has: 8 figures, 2 formulas, and 1 table.

ASSOCIATION: Insty*tut fizy*ky* AN URSR, Kiev (Institute of Physics, AN URSR)

SUBMITTED: 04Jul63 ENCL: 00

SUB CODE: NP NO REF SOV: 010 OTHER: 007

Card 2/2

ACCESSION NR: AP4042959 S/0048/64/028/007/1160/1163

AUTHOR: Zaika, N.I.; Nemets, O.F.; Yasnogorodskiy, A.M.

TITLE: Investigation of the low lying states of germanium 74, selenium 78, zirconium 93 and zirconium 95 by means of the stripping reaction /Report, 14th Annual Conference on Nuclear Spectroscopy held in Tibilisi 14-21 Feb 1964/

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v.28, no.7, 1964, 1160-1163

TOPIC TAGS: nuclear reaction, nuclear structure, germanium, selenium, zirconium

ABSTRACT: The (d,p) cross sections of Ge^{73}, Se^{77}, Zr^{92} and Zr^{94} for 13.6 MeV deuterons were measured with several scintillation spectrometers and absorbers. The targets consisted of powders of the enriched oxides or elements on polystyrene supports. The absolute cross sections were obtained by comparing the proton flux from the stripping reaction with the flux of elastically scattered deuterons, and comparing the latter with Rutherford's formula. An accuracy of 20% is claimed; the large error is ascribed principally to the difficulty of distinguishing the deuterons scattered elastically by the target nuclei from those scattered by carbon and oxygen nuclei in the support. Proton angular distributions are presented graphically for the

ACCESSION NR: AP4042959

ground states of all four nuclei, for one excited state of Ge^{74} and Zr^{95}, and for two excited states of Se^{78} and Zr^{93}. These angular distributions were in good agreement with Butler's theory. The possible and most probable spins and parities of the states were determined and are tabulated. The reduced widths and spectroscopic factors were derived by the method of M.H.Macfarlane and J.B.French (Rev.Mod.Phys.23, 567,1960) and are tabulated. The experimental results for Ge^{74} and Se^{78} are discussed in terms of the collective model, which has been successfully applied to the interpretation of the Coulomb excitations of these nuclei (F.K.McGowan, and P.H.Stelson,Phys.Rev.126,257,1962). The ratio of the reduced width of the first excited state to that of the ground state was found to be in agreement with the theoretical prediction for both nuclei. The resolution achieved in the measurement of the proton angular distribution for the second excited state of Se^{78} was not sufficient for an adequate comparison with the theory. The spectroscopic factors found for the ground states of Zr^{93} and Zr^{95} were in good agreement with those calculated with the shell model, and with those found by B.L.Cohen and O.V.Chubinsky (Phys.Rev.131,2184, 1963). The neutron was captured by Zr^{92} and Zr^{94} in a $d_{5/2}$ state when the ground state was formed, and in an $s_{1/2}$ state when the first excited state was formed. This is in agreement with the findings of N.I.Zaika, O.F.Nemets and V.V.Tokarevskiy

ACCESSION NR: AP4042959

(Zhur.eksper.i teor.fiz.44,17,1963) for other nuclei in the same region of the periodic system. Orig.art.has: 9 figures and 1 table.

ASSOCIATION: Institut fiziki Akademii nauk USSR (Institute of Physics of the Academy of Sciences, SSSR)

SUBMITTED: 00 ENCL: 00

SUB CODE: NP NR REF SOV: 002 OTHER: 006

3/3

ACCESSION NR: AP4042960 S/0048/64/028/007/1164/1168

AUTHOR: Nemets, O.F.; Rudchik, A.T.; Usik, V.A.

TITLE: Investigation of the low lying states of silicon 28 obtained in the (α,t) reaction on aluminum 27 /Report, 14th Annual Conference on Nuclear Spectroscopy held in Tbilisi 14-21 Feb 1964/

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v.28, no.7, 1964, 1164-1168

TOPIC TAGS: nuclear reaction, alpha reaction, nuclear spectroscopy, silicon, aluminum

ABSTRACT: The $Al^{27}(\alpha,t)Si^{28}$ reaction was investigated with the purpose of exploring the suitability of (α,t) reactions for nuclear spectroscopy investigations. For this purpose, (α,t) reactions would have the advantage over (d,n) reactions that the energies of the tritons could be more accurately measured than those of the neutrons. A beam of 27.2 MeV α-particles was employed, and two groups of tritons were distinguished, corresponding to the ground state of Si^{28} and its first excited state at 1.78 MeV. The cross sections were measured with an accuracy of 15%. The angular distributions of the two triton groups were sharply peaked in the forward

ACCESSION NR: AP4042960

direction; this indicates that the reaction was predominantly direct. It is estimated that compound nucleus formation contributed only 1% to the formation of the ground state, and 3% to the formation of the excited state. The reaction is discussed briefly in terms of the dispersion theory of direct reactions. It is concluded that the stripping mechanism should predominate, but that direct knock-out of the triton with capture of the α-particle, as well as other more complex mechanisms may contribute appreciably. The angular distributions are compared with the stripping reaction theory of M.El Nadi (Phys.Rev.120,1360,1960). The principal (forward) peak in the distribution of each of the triton groups is well represented by the theory with a value of the the interaction radius (5.1 fermi) that is consistent with other measurements on Al^{27}. A secondary maximum at about 30° cannot be explained by simple stripping. The position of this maximum can be obtained from Butler's theory of direct reactions with knock-out processes included, but only by assuming a large value for the interaction radius. It is concluded that (α,t) reactions are suitable for nuclear spectroscopy investigations, but that the angular distributions can be explained only by considering the contributions of various reaction mechanisms and the distortion of the wave functions by the Coulomb field. Orig.art.has: 3 formulas, 3 figures and 3 tables.

2/3

ACCESSION NR: AP1041286

ASSOCIATION: Institut fiziki Akademii nauk USSR (Institute of Physics, Academy of Sciences, SSSR)

SUBMITTED: 00 ENCL: 00

SUB CODE: NP NR REF SOV: 002 OTHER: 006

3/3

L 14492-65 EWT(m) SSD/AFWL/ESD(t)

ACCESSION NR: AP4045835 S/0048/64/028/010/1637/1656

AUTHOR: Kalin, E.I.; Nemets, O.F.; Tokarevskiy, V.V.

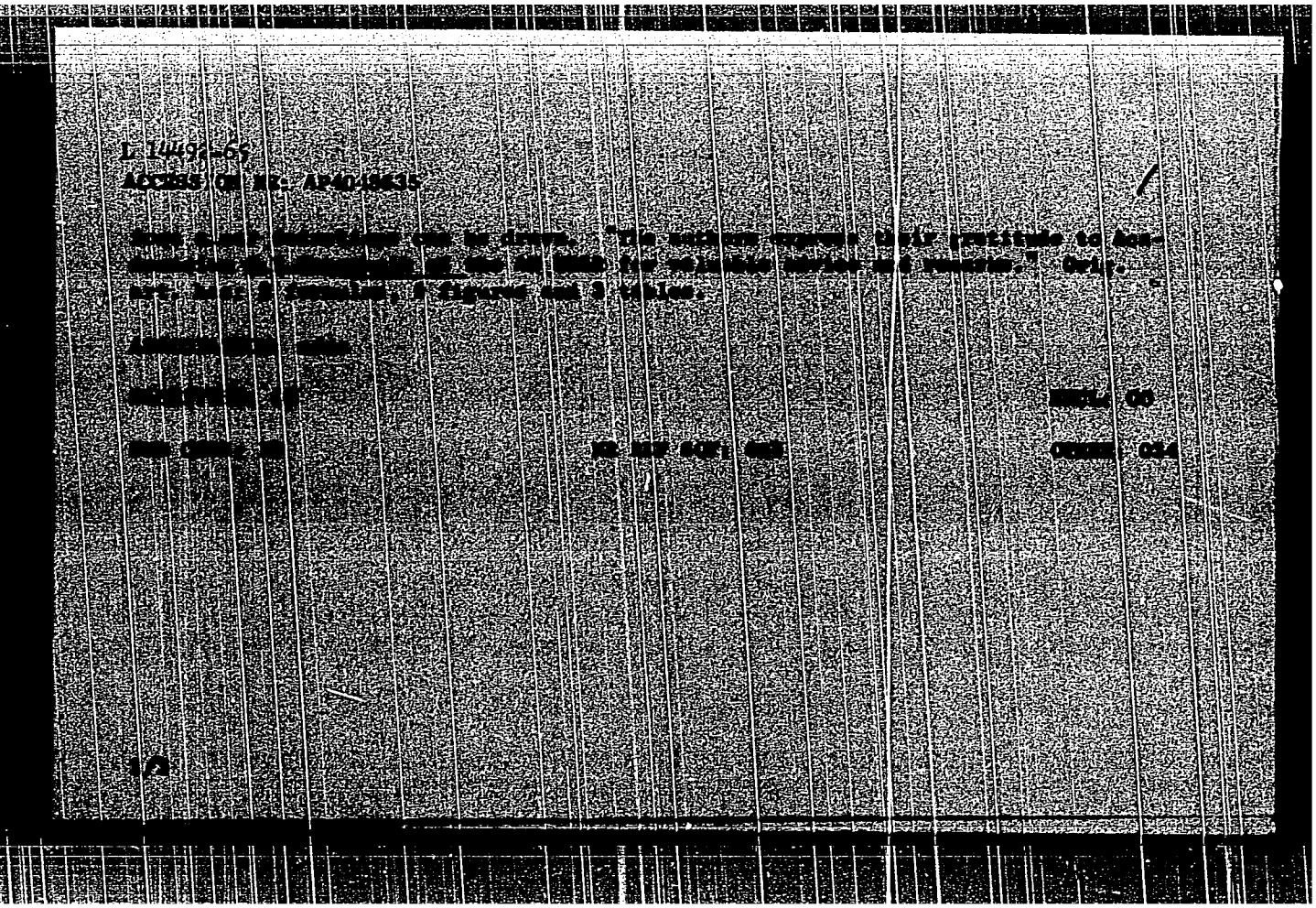
TITLE: Determination of the model nature of levels by means of direct (d,p) and (d,d') reactions /Report, Fourteenth Annual Conference on Nuclear Spectroscopy held in Tbilisi 14-22 Feb 1964/

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v. 28, no. 10, 1964, 1637-1656

TOPIC TAGS: nuclear physics, nuclear structure, nuclear model, deuteron reaction, deuteron scattering, inelastic scattering, stripping reaction

ABSTRACT: This paper presents a review of studies of (d,p) and (d,d') reactions from the point of view of determining the "model nature" (energy, spin, parity, transition probability, etc.) of the nuclear levels involved. The deuteron is an efficient projectile for this purpose, for its low binding energy and long mean free path within the nucleus insure a low probability for compound nucleus formation. Many experimental data are reviewed and the inferences that can be drawn from them are discussed in detail. The raw experimental data from (d,p) and (d,d') reactions are the gross structure of the energy spectra of the reaction products, and

angular distributions. In the (d,p) reaction principally single-particle neutron states are excited. Much information concerning them can be obtained, including reduced widths and spectroscopic factors, nuclear shell structure and the vibrational nature of some levels. The states participating in inelastic scattering are mostly collective, and the spectrum of the scattered deuterons changes smoothly from one target nucleus to a neighboring one. The spectrum regularly shows a strong peak at an energy transfer of about 1 MeV and (for heavy nuclei) a broad "anomalous" peak at about 2.5 MeV. The first peak corresponds to the excitation of a single-phonon quadrupole 2^+ level, and the anomalous peak to a 3^- octupole level. Simple stripping theory (plane wave Born approximation) is adequate for analyzing angular distributions at small angles when the incident deuteron energy exceeds 10 MeV and the mass number of the target nucleus is less than 100. For heavy target nuclei, low energy deuterons, or large scattering angles, this approximation is no longer adequate. Considerable success has been achieved with a distorted wave Born approximation in which the distortions due to both the Coulomb and the optical potentials are included. In the final section the (d,t), (d,He^3), (d,α), (α,p), (α,n), (α,d), (α,t) and (α,He^3) reactions are discussed very briefly (some of them are merely mentioned). Many more experimental data concerning α-particle reactions are needed be-



[illegible] EWT(m)/[illegible]/EWP(t)
[illegible] S/0048/64/028/010/1711/1713

AUTHOR: [illegible]; [illegible]; [illegible], V.V.

TITLE: Investigation of the low-lying states of Si^{30} /Report, Fourteenth Annual Conference on Nuclear Spectroscopy held in Tbilisi (14-22 Feb 1964)/

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v.28, no.10, 1964, 1711-1713

TOPIC TAGS: nuclear physics, nuclear spectroscopy, alpha reaction, silicon, aluminum

ABSTRACT: The energy and angular distribution of protons from the $Al^{27}(\alpha,p)Si^{30}$ reaction with 27.2 MeV α-particles was investigated in order to assess the utility of α-particle reactions for nuclear spectroscopic investigations. This reaction was selected for study because the excited states of both nuclei are well known. Three groups of protons were distinguished, corresponding to the 0^{+} ground state, the 2^{+} 2.25 MeV state, and the 3.61 and 3.89 MeV states of Si^{30}. The angular distributions are compared with predictions of theories of proton pick-up, triton stripping, and successive stripping. Good agreement was obtained with the predictions of the successive stripping theory for angles less than 55° in the center of mass system, but

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with a [illegible] [illegible] that exceeds the [illegible] radius by 2 fermi. It is concluded that the [illegible] reaction can serve as a nuclear spectroscopic tool, but that many more experimental data are required and a distorted wave theory of the reaction must be developed. Orig. art. has: 4 formulas and [illegible] figures.

ASSOCIATION: Institut fiziki Akademii nauk UkrSSR (Physics Institute, Academy of Sciences, UkrSSR); Kiyevskiy gosudarstvennyy universitet (Kiev State University)

SUBMITTED: 00 ENCL: 00

SUB CODE: NP NR REF SOV: 000 OTHER: 005

2/2

L [illegible] EWT(m) DIAAP/AFWL/SSD/ESD(gs)/ESD(t)

ACCESSION NR: AP[illegible]44 S/0048/64/028/010/1714/1718

AUTHOR: Dobrikov, V. N.; Pikar, F.; Nemets, O. F.; Stryuk, Yu. S.; Tokarevskiy, V. V.

TITLE: Investigation of the low-lying states of Mg^{25} /Report, Fourteenth Annual Conference on Nuclear Spectroscopy held in Tbilisi 14-22 Feb 1964/

SOURCE: AN SSSR. Izv. Seriya fizicheskaya, v. 28, no. 10, 1964, 1714-1718

TOPIC TAGS: nuclear physics, nuclear spectroscopy, deuteron reaction, aluminum, magnesium

ABSTRACT: The energy and angular distribution of α-particles from the $Al^{27}(d,\alpha)$-Mg^{25} reaction with 13.6 MeV deuterons was investigated in order to assess the utility of (d,α) reactions for nuclear spectroscopy investigations. A semiconductor detector with a resolution of 70 keV was employed with a 50-channel pulse height analyzer. Eight groups of α-particles were distinguished, corresponding to 13 levels of Mg^{25}. All the angular distributions showed a rise at small angles, but in contrast to the case of other nuclear reactions, the diffraction structure was not marked. The angular distributions were compared with the two-nucleon pick-up theory

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found that, in contrast with the behavior observed in (d,p) reactions, the probabilities for the transfer of all angular momenta permitted by the selection rules were approximately equal. Orig.art.has: 3 formulas, 3 figures and 1 table.

ASSOCIATION: Institut fiziki Akademii nauk UkrSSR (Physics Institute, Academy of Sciences, UkrSSR); Kiyevskiy gosudarstvennyy universitet (Kiev State University)

SUBMITTED: 00 ENCL: 00

SUB CODE: NP NR REF SOV: 001 OTHER: 003

2/2

ACCESSION NR: AP4037606 S/0056/64/046/005/1898/1900

AUTHORS: Nemets, O. F.; Pikar, F.; Tokarevskiy, V. V.

TITLE: Inelastic scattering of deuterons by some even tin isotopes

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 5, 1964, 1898-1900

TOPIC TAGS: tin, level energy, deuteron reaction, angular distribution, nuclear spectroscopy, inelastic scattering, quadrupole moment

ABSTRACT: Measurements were made, at a deuteron energy 13.6 MeV, of the differential cross sections of the inelastic scattering from the isotopes $Sn^{116, 118, 120, 122, 124}$ with excitation of the first 2^+ levels and of the states which form a gross-structure peak at $Q \approx -2.5$ MeV. The deuterons were recorded by a selective scintillation spectrometer described by the author previously (PTE, No. 2, 34, 1962). The absolute cross sections were determined by a method

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ACCESSION NR: AP4037606

similar to that described by the authors previously (Izv. AN SSSR, ser. fiz. v. 27, 927, 1963). A comparison of the inelastic scattering spectra of deuterons with the spectra of protons from the (d, p) stripping reaction on the isotopes of $Sn^{118, 120}$ shows that the excitation probability of single-particle states is very low in the inelastic scattering, whereas the quadrupole 2^+ levels are excited one order of magnitude more intensely than in (d, p) stripping. Orig. art. has: 2 figures.

ASSOCIATION: Institut fiziki Akademii nauk Ukrainskoy SSR (Institut of Physics, Academy of Sciences UkrSSR); Joliot-Curie Laboratory, Orsay, France

SUBMITTED: 28Jun63 DATE ACQ: 09Jun64 ENCL: 02

SUB CODE: NP NR REF SOV: 004 OTHER: 001

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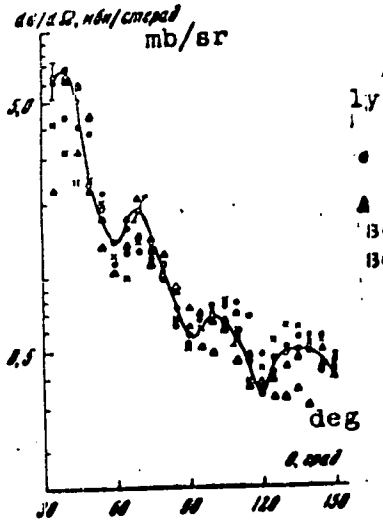
ACCESSION NR: AP4037606

ENCLOSURE: 01



Angular distributions of deuterons inelastically scattered by tin isotopes: • - Sn^{116}, × - Sn^{118}, ○ - Sn^{120}, △ - Sn^{122}, ▲ - Sn^{124}. Abscissa - laboratory angle of scattering, ordinate - differential cross section in mb/sr

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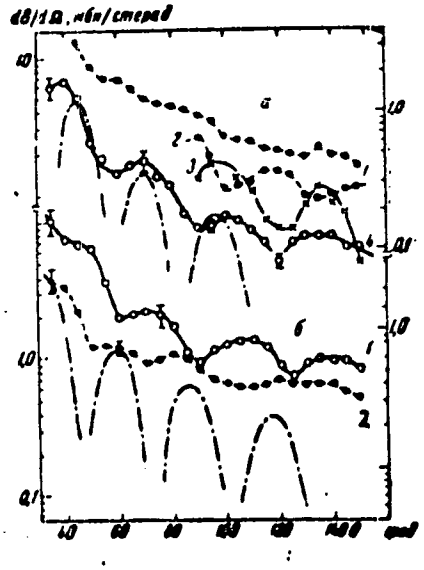
ACCESSION NR: AP4037606 ENCLOSURE: 02



Angular distributions of 13.6-MeV deuterons inelastically scattered by tin isotopes: a - scattering by Sn^{120} , b - scattering by Sn^{116} . Dash-dot curves - Huby-Newns theory. Other curves pertain to various levels and peaks. Ordinates - differential cross section in mb/sr (left - curves a4 and b2, right - other curves). Abscissas - scattering angles of deuterons in the laboratory system.

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ACCESSION NR: AP4037607 S/0056/64/046/005/1900/1901

AUTHOR: Nemets, O. F.; Pikar, F.; Slyusarenko, L. I.; Tokarevskiy, V. V.

TITLE: Elastic scattering of deuterons by strontium and tin isotopes

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 5, 1964, 1900-1901

TOPIC TAGS: strontium, tin, deuteron, elastic scattering, angular distribution, diffraction pattern

ABSTRACT: The elastic scattering of 13.6-MeV deuterons by strontium and tin isotopes. Measurements in the angle range 10 -- 150° were made with a selective scintillation spectrometer. The strontium targets were polystyrene films impregnated with $SrCO_3$. In the angle region $\theta \leq 30°$, the peaks corresponding to elastic scattering by the strontium could be separated reliably from the peaks corresponding to the elastic scattering by carbon and oxygen. The tin targets were free-standing foils 3 -- 4 mg/cm^2 thick with 90% enrichment. In the region of angles larger than 25° the angular distributions of Sr have a clear out diffraction structure, which changes little on going from isotope to isotope. The angular distributions obtained for the tin isotopes are in good agreement with those of N. Cindro

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ACCESSION NR: AP4037607

and N. S. Wall for natural tin at 13.5 MeV (Phys. Rev. v. 119, 1340, 1960). On all the tin isotopes one observes a clear out diffraction structure, with no noticeable difference in the cross sections for the different isotopes. From the comparison of the elastic scattering of deuterons by tin at 15, 13.6 and 11.8 MeV it is concluded that the diffraction structure becomes more clearly pronounced with increasing energy and shifts towards the smaller angles.

ASSOCIATION: None

SUBMITTED: 28Jun63 DATE ACQ: 09Jun64 ENCL: 01

SUB CODE: NP NR REF SOV: 002 OTHER: 001

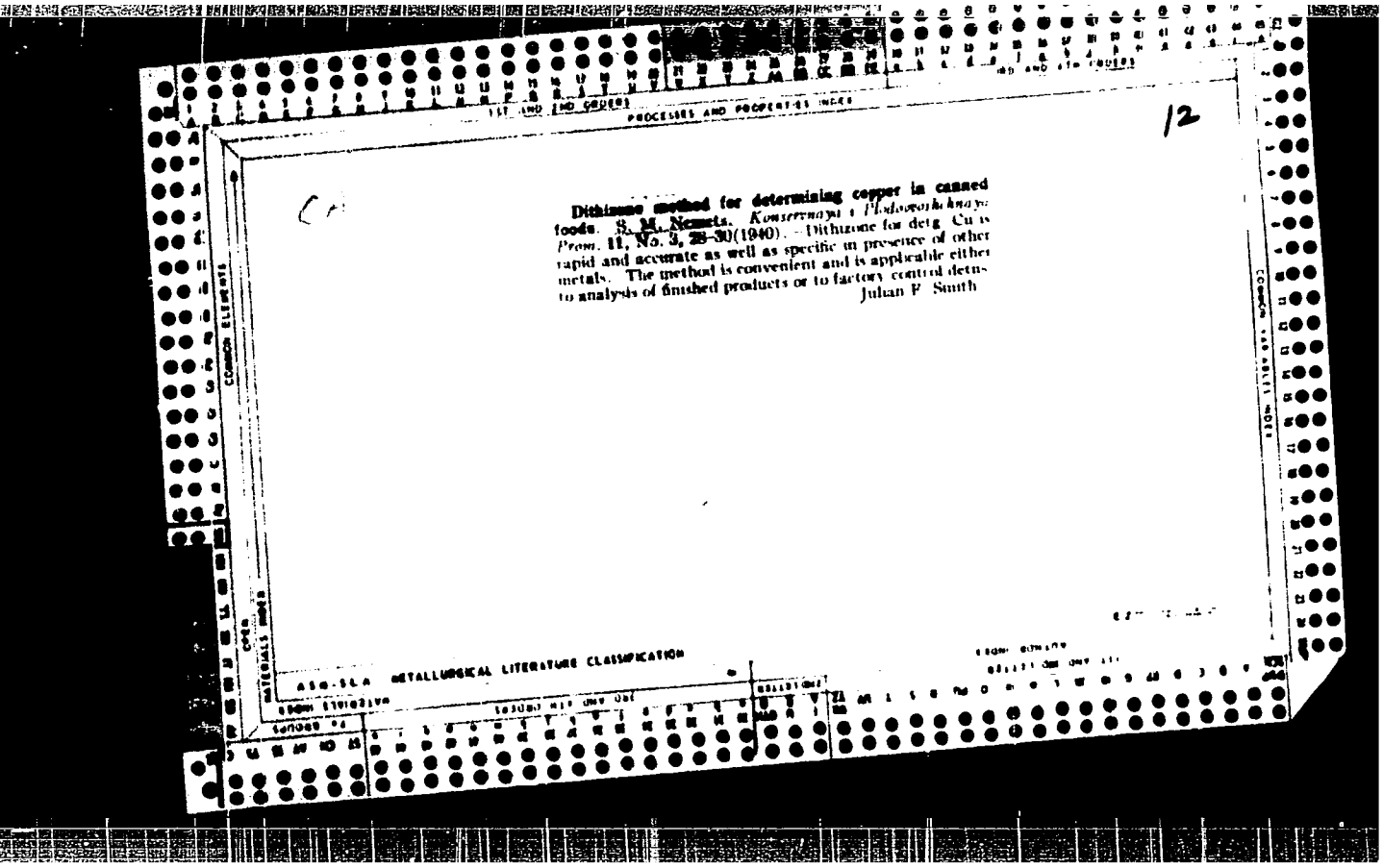
Card 2/3

NEMETS, O.F., prof.

Annual meeting of the Physical Society of the German Democratic Republic. Vest. AN SSSR 35 no.9:89 '65. (MIRA 18:9)

NEMETS, O.F.; SOKOLOV, M.V.; STRUZHKO, B.G.

Use of the neutron-proton coincidence method in studying the angular and energy correlations in the Ni(d, np)Ni reaction. IAd. fiz. 1 no.6:1014-1018 Je '65. (MIRA 18:6)



12

Dithizone method for determining copper in canned foods. S. M. Nemets. *Konservnaya i Plodovoshchnaya Prom.* **11**, No. 3, 28-30(1940). — Dithizone for detg. Cu is rapid and accurate as well as specific in presence of other metals. The method is convenient and is applicable either to analysis of finished products or to factory control determ.

Julian F. Smith

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

GRZHIVO, V.S.; NEMETS, S. M.

Fishery Products

Chemical composition and food value of canned fish., Ryb. khoz., 28, no. 2, 1952.

9. Monthly List of Russian Accessions, Library of Congress, May 1952, Uncl.

VAL'TER, L. YA.; NEMETS, S. M.; SINYAKOVA, Z. M.

Fishery Products - Analysis

Vitamin content in canned fish. Ryb. khoz., 28, No. 5, 1952.

Monthly List of Russian Accessions Library of Congress October 1952. UNCLASSIFIED.

GRZHIVO, V.S., kandidat tekhnicheskikh nauk; NEMETS, S.M., starshiy nauchnyy sotrudnik.

More precise measurements obtained by using the RL laboratory refractometer. Ref.nauch.rab. VNIIKP no.2:41-45 '54. (MLRA 9:4)
(Refractometry) (Food--Analysis)

GRZHIVO, V.S., kandiat tekhnicheskikh nauk; [redacted] starshiy nauchnyy sotrudnik; VAL'TER, L.Ya., mladshiy nauchnyy sotrudnik; SKOPCHENKO, G.A., mladshiy nauchnyy sotrudnik.

Nutritive value of canned foods. Trudy VNIIKP no.3:55-61 '54. (MLRA 9:8)

(Food, Canned)

GRZHIVO, V.S., kandidat tekhnicheskikh nauk; [redacted], S.M., starshiy nauchnyy sotrudnik; VAL'TER, L.Ya., mladshiy nauchnyy sotrudnik; SKOPCHENKO, G.A., mladshiy nauchnyy sotrudnik.

Chemical changes in tomatoes during processing. Trudy VNIIKP no.3: 88-99 '54. (MLRA 9:8)

(Tomatoes) (Food--Analysis)

NEMETS, S. M.; Grzhivo, V. S. and Val'ter, L.

All-Union Scientific-Research Institute of the Canning Industry

"Vitamin Content of Canned Meats" (Thiamine, riboflavine, and nicotinic acid contents of various Russian canned-meat products are tabulated)

SOURCE: Myasnaya Ind. SSSR, Vol 25, No 2, pp 52-54, 1954

GRZHIVO, V.S.; NEMETS, S.M.; ARKHANGEL'SKAYA, A.P.; BERKH, M.S.

Use of various vegetable oils in the preparation of canned vegetables. Kons. i ov. prom. 12 no.4:17-20 Ap '57. (MIRA 10.6)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut konservnoy i ovoshchesushil'noy promyshlennosti.
(Vegetables--Preservation) (Oils and fats, Edible)